TITLE OF THE INVENTION

FILTER TIPPING MACHINE WITH DOUBLE TIPPING PAPER FEED

INVENTOR

Manfred DOMBEK

P24923.S04.doc

FILTER TIPPING MACHINE WITH DOUBLE TIPPING PAPER FEED

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority under 35 U.S.C. §119 of European Patent Application No. 03 010 268.5, filed on May 7, 2003, the disclosure of which is expressly incorporated by reference herein in its entirety.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates to a method for joining smoking article components and a machine of the tobacco processing industry, in particular a filter tipping machine.

2. Discussion of Background Information

[0003] In filter tipping machines, a filter piece or tip is inserted between cut tobacco rods spaced in a lengthwise axial manner, such that a glued uniting band is subsequently adhered to the assembled cigarette/tip/cigarette group. The glued uniting band is then fed with a defined spacing to the cigarette/tip/cigarette group via a suction roll of a tipping apparatus. A defined spacing is the pre-selected spacing of the cigarette/tip/cigarette groups which is greater than the length of the uniting band.

[0004] A method and device of the type described above serve, in particular, for the assembly of filter cigarettes conveyed in a crosswise axial manner on a so-called "filter tipping machine." Over time its output regarding the particles produced and ejected per time unit has repeatedly sharply increased or has had to be adjusted to the increased productivity of the upstream cigarette rod maker (rod-making machine).

[0005] German Patent No. DE-C-39 18 137, as well as its U.S. patent family member U.S. Patent No. 5,054,346, describes a tipping paper unit of a filter tipping machine. The glued tipping paper is hereby fed as an endless tipping paper web and cut into individual sheets or uniting bands by a cutting device.

After cutting, these uniting bands are separated and brought up to the conveying speed of the cigarette/filter/cigarette groups transported in portions.

[0006] German Patent Application No. DE-A-196 26 679, as well as its U.S. patent family member U.S. Patent No. 5,715,838, describes a filter tipping machine for a twin-track cigarette production machine in which two different conveyor paths of the tobacco articles are provided for the gluing and wrapping by rolling of the coating strips.

[0007] Furthermore, it is known from European Patent Application No. EP-A-1 108 369 to provide cigarette/filter/cigarette groups with a tipping paper web in that only every first group of a series of cigarette/filter/cigarette groups on a first drum is provided with a coating strip of a first tipping apparatus, and every second group is conveyed out of the conveyor path of the first group and provided with a coating strip of a second tipping apparatus on a second drum. Wrapping with the strip by rolling the two separate groups takes place consecutively in separate rolling devices. The groups are not joined again to produce an alternating series of groups until after the respective wrapping by rolling.

SUMMARY OF THE INVENTION

[0008] The present invention ensures a high product quality of smoking articles with a filter tipping machine even with higher productive capacities, while construction expense is kept as low as possible.

[0009] According to the invention, a method is provided for joining smoking article components in which the articles of a first and a second group are fed as cigarette/tip/cigarette groups to a first tipping apparatus and the articles of the first group are respectively provided with a uniting band. Subsequently, the articles of the first and second group are fed to a second tipping apparatus and the articles of the second group are provided respectively with a uniting band. The method further includes that the articles of the first and second group are wrapped with the uniting bands in a rolling device.

[0010] By providing two tipping apparatuses in a single-track filter tipping machine, the productive capacity is increased, since the feed of the coating strips takes place on two tracks. In this manner, every first article group is provided with a coating strip from the first tipping apparatus and every second article group is provided with a coating strip from the second tipping apparatus. Thus, the conveyor drum or the conveyor device can be operated at a higher speed, and the coating strips are reliably adhered to the respective article group so that the quality in the production of the cigarettes is increased.

[0011] Advantageously, it is thereby provided for the uniting bands to be transferred to the articles while the article groups are conveyed on a conveyor device. The structural expense is substantially reduced by conveying the articles on a single conveyor device and simultaneously applying the uniting bands to the article groups. In this case it is not necessary for the article groups to have different conveyor paths in order to be provided with a coating strip.

[0012] A further improvement is achieved in that the uniting bands are partially applied to the articles after the transfer. The application of a free end of a uniting band to a cigarette/tip/cigarette group is described in European Application No. 020 235 24.8, in which a folding star or a so-called "rolling star" is provided for the application of the one free end of a uniting band to a tobacco article.

[0013] In a further development, the articles of the first and second group are arranged in an alternating manner on the conveyor device before the transfer of the uniting band to the first group.

[0014] Moreover, it is favorable if the uniting bands are transferred to the articles of the first and/or second group at a constant speed.

[0015] According to the invention, a machine of the tobacco processing industry, in particular a filter tipping machine, is provided that includes, for a first and second group of cigarette/tip/cigarette groups, respectively, a tipping apparatus, in which the tipping apparatuses are arranged one behind the other in the conveying direction of the article groups, and a common rolling device.

[0016] According to the inventive concept, tipping paper webs are fed in twin tracks to a single-track filter tipping machine so that the machine can be operated at a higher conveying speed. The adhering of the paper strip to the article groups is improved through the two tipping apparatuses, since one tipping apparatus no longer has to provide all the article groups with a tipping paper web.

[0017] A simplification in the structure results in that the tipping apparatuses are arranged on a conveyor device for the first and second article group.

[0018] Moreover, advantageously the spacing of the seats of the conveyor device is equidistant so that, e.g., a conveyor drum with a predetermined spacing is used.

[0019] In a preferred embodiment, at least one application device is provided for at least one free end of a uniting band to the articles of the first and/or second group so that the uniting bands adhere better to the article groups during a subsequent wrapping by rolling of the article groups. The starting process in the wrapping by rolling is clearly improved by the partial application of the uniting band.

[0020] Moreover, advantageously one application device is respectively provided for each article group.

[0021] In a preferred further development, the spacing of the feed drum of each tipping apparatus for the uniting bands is twice as big as the spacing of the conveyor device, since the tipping apparatuses respectively provide half of the total article groups conveyed with uniting bands.

[0022] Furthermore, advantageously the length of the uniting bands can be adjusted at each tipping apparatus so that, e.g., after a change of the conveyor drum to a different spacing, an adjustment of the cut uniting bands is easily possible. A change of the conveyor drum is necessary when cigarettes with a different diameter are conveyed.

[0023] In particular the conveyor device is embodied or formed as a grooved drum or belt conveyor.

[0024] The machine according to the invention is preferably embodied or formed in a single-track manner, i.e., the article groups arranged and conveyed in a crosswise axial manner one behind the other are transported in one conveyor plane and provided with a uniting band.

[0025] The present invention is directed to a method for joining article components. The method comprises feeding articles of a first and second group to a first tipping apparatus, transferring a uniting band to the articles of the first group from the first tipping apparatus, feeding the articles of the first and second groups to a second tipping apparatus, transferring a uniting band to the articles of the second group from the second tipping apparatus, and wrapping the uniting bands around the articles of the first and second group in a rolling device.

[0026] According to a feature of the invention, the rolling device can be a common rolling device for the first and second groups.

[0027] In accordance with another feature of the instant invention, the article components can be smoking article components.

[0028] According to still another feature of the invention, the first and second groups may be composed of cigarette/tip/cigarette groups.

[0029] Further, the uniting bands may be transferred to the articles while the first and second groups are conveyed on a conveyor device.

[0030] The process can also include, after the uniting band is transferred to a respective article, partially applying the uniting band to the respective article.

[0031] Moreover, before the uniting bands are transferred to the articles of the first and second group, the articles of the first and second group can be arranged in an alternating manner on a conveyor device.

[0032] According to a further feature of the present invention, the uniting bands may be transferred to the articles of the first and second groups at a constant speed.

[0033] In accordance with another feature, the articles of the first and second group can be conveyed with a same spacing at least between the first tipping apparatus and the rolling device.

[0034] The present invention is directed to a filter tipping machine structured to perform the above joining process.

[0035] The present invention is directed to a machine of the tobacco processing industry that includes a first and second tipping apparatus arranged one behind the other in a conveying direction, and a common rolling device.

[0036] In accordance with a feature of the invention, the machine can be a filter tipping machine.

[0037] The machine can also include a conveyor device arranged to convey articles of a first and second article group, in which the article groups are alternatingly arranged on the conveyor device in a conveying direction. The first and second tipping apparatuses can be arranged on the conveyor device. Further, the conveyor device can include a plurality of equidistantly spaced seats.

[0038] Further, the conveyor device may include one of a grooved drum or belt conveyor.

[0039] In accordance with another feature of the invention, the machine may also include at least one application device structured and arranged to apply at least one free end of a uniting band to the articles of the first and second group. Further, the at least one application device may include at least one application device for each article group. Each of the first and second tipping apparatuses can include a feed drum having a spacing for the uniting bands that is twice as long as a spacing of the respective conveyor device. Further, a length of the uniting band can be adjustable at each tipping apparatus.

[0040] According to another feature, the machine may include a single-track.

[0041] The invention is directed to a method for joining article components that includes alternatingly conveying articles of at least a first and second article group in a conveying direction, transferring uniting bands to the articles of the first group

from the first tipping apparatus, transferring uniting bands to the articles of the second group from the first tipping apparatus, and wrapping the uniting bands around the articles of the first and second group in a common rolling device.

[0042] In accordance with a feature of the invention, after transferring the uniting bands to the articles of the first group, ends of the uniting bands may be connected to the article.

[0043] Further, the first and second article groups may be conveyed in the conveying direction on a conveyor device, and the first and second tipping apparatuses can be arranged along the conveyor device.

[0044] The articles of the first and second article groups can be fed with a same spacing on the conveyor device. Moreover, the article of the first and second article groups can be fed with a same spacing through the first and second tipping apparatuses.

[0045] The present invention is directed to a machine for joining article components that includes a conveyor device structured and arranged to alternatingly convey articles of at least a first and second article group in a conveying direction, a first tipping apparatus arranged along a conveyor path of the conveyor device structured to transfer uniting bands to the articles of the first group, and a second tipping apparatus arranged along the conveyor path of the conveyor device structured to transfer uniting bands to the articles of the second group.

[0046] According to a feature of the invention, a rolling device can be positioned to receive the articles from the conveyor device. The articles of the at least first and second article groups may be successively rolled in the rolling device to connect the uniting bands to the articles.

[0047] The machine can further include a first folding star arranged downstream, with respect to the conveying direction, from the first tipping apparatus, and a second folding star arranged downstream, with respect to the conveying direction,

from the second tipping apparatus. The second tipping apparatus may be arranged downstream from the first folding star.

[0048] In accordance with still yet another feature of the instant invention, the conveyor device can include seats for the articles of the first and second article groups having a same spacing.

[0049] Other exemplary embodiments and advantages of the present invention may be ascertained by reviewing the present disclosure and the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0050] The present invention is further described in the detailed description which follows, in reference to the noted plurality of drawings by way of non-limiting examples of exemplary embodiments of the present invention, in which like reference numerals represent similar parts throughout the several views of the drawings, and wherein:

[0051] Figure 1 diagrammatically illustrates a sectioned view of a drum arrangement according to the features of the invention; and

[0052] Figure 2 diagrammatically illustrates an alternative drum arrangement according to the features of the invention.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

[0053] The particulars shown herein are by way of example and for purposes of illustrative discussion of the embodiments of the present invention only and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual aspects of the present invention. In this regard, no attempt is made to show structural details of the present invention in more detail than is necessary for the fundamental understanding of the present invention, the description taken with the drawings making apparent to those skilled in the art how the several forms of the present invention may be embodied in practice.

[0054] Figure 1 shows in diagrammatic form a front view of a drum arrangement according to the invention. The drum arrangement according to the invention is used in so-called "filter tipping machines" with which one skilled in the art is familiar from the prior art. The filter tipping machine receives cut tobacco rods of double unit length from a cigarette rod maker, which are cut and spread apart on their conveyor path to an assembly drum 21. At the same time, filter rods are removed from a filter rod magazine and cut into filter pieces so that double-length filter pieces are inserted between the two spaced apart, i.e., spread, cut tobacco rods (in a lengthwise axial manner) via a drum arrangement. A series of cigarette/tip/cigarette groups 50 and 60 arranged and assembled in a crosswise axial manner one behind the other is formed on assembly drum 21.

[0055] Assembled article groups 50 and 60 are transferred to a conveyor drum 22 and transported to a first tipping apparatus 10.1 for first group 50. For example, DE-C-39 18 137 and its U.S. patent family member U.S. Patent No. 5,054,346 describe a tipping apparatus in detail, and the disclosures of these documents are expressly incorporated be reference herein in their entireties.

[0056] A glued and conveyed tipping paper web 11.1 is cut on a cutting drum 12.1 by the knives of a knife drum 13.1 into coating strips 40.1 of equal length. Cut coating strips 40.1 are transferred and adhered to the articles of first group 50 on conveyor drum 22.

[0057] Subsequently, both article groups 50 and 60 are transported further in the conveyor direction to a folding star 23.1 that applies the front end of coating strip 40.1 seen in the conveyor direction to article group 50. Subsequently, the articles 50 and 60 are conveyed further and fed to a tipping apparatus 10.2 for second article group 60.

[0058] Second tipping apparatus 10.2 has a knife roll 13.2 that cuts tipping paper webs 11.2 in interaction with suction roll 12.2. Cut uniting bands 40.2 are transferred and adhered to the tobacco articles or cigarette/tip/cigarette groups 60.

The front end of uniting band 40.2 is then applied to articles 60 on conveyor drum 22 by a folding star 23.2.

[0059] Subsequently, the articles of first and second groups 50 and 60 are transferred from conveyor drum 22 to a conveyor drum 26 to be transported to a rolling device 27 having a rolling block, such that uniting bands 40.1 and 40.2 are completely wrapped around cigarette/tip/cigarette groups 50 and 60. The completely wrapped articles 50 and 60 are subsequently provided to a conveyor drum and to a filter tipping machine for the further treatment process.

[0060] According to the invention, the spacing of the grooves on conveyor drum 22 is constant, i.e., equidistant, and tipping apparatuses 10.1 and 10.2 are modified so that the tipping paper feed drums or suction rolls 12.1 and 12.2 feature a spacing twice as big as that of conveyor drum 22. Overall the productive capacity of a filter tipping machine with such a single-track filter tipping machine with a twin-track coating feed via tipping apparatuses 10.1 and 10.2 is increased. In this manner, the structural expenditure is low, since two tipping apparatuses are arranged only at one conveyor device.

[0061] Figure 2 shows an alternative embodiment of the twin-track tipping paper feed to first and second article groups 50 and 60. Article groups 50 and 60 are transported in this embodiment in a linear manner on a belt conveyor 32 instead of conveyor drum 22 (Figure 1). The spacing of article groups 50 and 60, is provided in a constant manner on belt conveyor 32.

[0062] It is noted that the foregoing examples have been provided merely for the purpose of explanation and are in no way to be construed as limiting of the present invention. While the present invention has been described with reference to an exemplary embodiment, it is understood that the words which have been used herein are words of description and illustration, rather than words of limitation. Changes may be made, within the purview of the appended claims, as presently stated and as amended, without departing from the scope and spirit of the present invention in its aspects. Although the present invention has been described herein

with reference to particular means, materials and embodiments, the present invention is not intended to be limited to the particulars disclosed herein; rather, the present invention extends to all functionally equivalent structures, methods and uses, such as are within the scope of the appended claims.

List of Reference Numbers

10.1	Tipping apparatus
10.2	Tipping apparatus
11.1	Tipping paper web
11.2	Tipping paper web
12.1	Suction roll
12.2	Suction roll
13.1	Knife roll
13.2	Knife roll
21	Assembly drum
22	Conveyor drum
23.1	Folding star
23.2	Folding star
26	Drum
27	Rolling device
32	Belt conveyor
40.1	Uniting band
40.2	Uniting band
50	Tobacco article (cigarette/tip/cigarette group)
60	Tobacco article (cigarette/tip/cigarette group)